

Service on ThunderLT with Promise FastTrack Controller

Brief Description:

ThunderLT uses RAID-10 technology. This is an amalgam of RAID 0 and RAID 1 put together – RAID 0 is a stripeset with no fault-tolerance (also known as “JBOD”), and RAID 1 is a mirror set (one drive carrying an identical copy of all data on the other). Put together, RAID 10 is a mirrored stripeset – two drives striped together, with an identical copy of all data on two other drives striped together. ThunderLT uses the minimum RAID-10 configuration of four drives. Generically, RAID-10 can be scaled up two drives at a time (for example, an 8-drive RAID 10 is a 4-drive RAID-0 mirrored by another four-drive RAID-0).

The Promise FastTrack TX2000 RAID-10 controller offers this functionality in a simple BIOS-driven solution. The minimal RAID-10 configuration of four ATA drives is found inside ThunderLT’s system unit connected to the Promise controller.

Failure Symptoms to Expect With This Configuration:

- When rebooting, the Promise controller states the array is “Critical” or “Off Line,” and forces operator intervention to proceed (by choosing whether to enter its BIOS utility or proceeding to boot the operating system).
- Long wait times typically in Thunder when accessing certain areas of the database window or playing certain clips.
- Events in the Windows System Event log related to Physical Drive 1 or in Device Manager, or the array’s volume is shown as “At Risk” instead of “Healthy.”

Initial configuration of array:

1. During the boot process, with no array defined yet, the Promise controller’s banner looks like this:

```
FastTrak TX2000 <tm> BIOS Version 2.00.0.33
<c> 195-2002 Promise Technology, Inc. All rights reserved.
```

```
No Array is defined.....
```

```
Press <Ctrl-F> to enter FastBuild <tm> Utility or
Press <ESC> to continue booting...
```

Pressing Ctrl-F as described will show the Promise FastBuild Utility as shown:

```
FastBuild (tm) Utility 1.32 (c) 1996-2001 Promise Technology, Inc.
[ Main Menu ]

Auto Setup..... [ 1 ]
View Drive Assignments..... [ 2 ]
Define Array..... [ 3 ]
Delete Array..... [ 4 ]
Rebuild Array..... [ 5 ]
Controller Configuration..... [ 6 ]

[ Keys Available ]
Press 1..6 to Select Option [ESC] Exit
```

2. Choosing “Auto Setup” (by pressing “1”) will show the following menu:

```
FastBuild (tm) Utility 1.32 (c) 1996-2001 Promise Technology, Inc.
[ Auto Setup Options Menu ]
Optimize array for : Security
Typical Application to use: DESKTOP

[ Auto Setup Configuration ]

Mode ..... Mirror/Stripe
Spare Drive ..... 0
Drive(s) Used in Array ..... 4
Array Disk Capacity (size in MB)..... #####

[ Keys Available ]
[▲] Up [▼] Down [◀▶,Space] Change Option [ESC] Exit [CTRL-Y] Save
```

The settings shown above are the preferred settings, not the defaults. When creating the array for the first time, make sure to select “Security” as the first choice. “Typical Application” setting has not been defined. Verify that the Array Mode as shown in the middle section shows “Mirror/Stripe.” Press CTRL-Y per the menu on the bottom once the settings are correct to see the following message:

```
FastBuild (tm) Utility 1.32 (c) 1996-2001 Promise Technology, Inc.
[ Auto Setup Options Menu ]
Optimize array for : Security
Typical Application to use: DESKTOP

[ Auto Setup Configuration ]

Mode ..... Mirror/Stripe
Spare Drive ..... Array has been created....
                  <Press Any Key to REBOOT>
Drive(s) Used in A
Array Disk Capacity (size in MB)..... #####

[ Keys Available ]
[▲] Up [▼] Down [◀▶,Space] Change Option [ESC] Exit [CTRL-Y] Save
```

- Once the array is created, press a key to reboot, then the Promise controller’s banner should be as shown below; however, this time only a brief pause for the Ctrl-F hotkey will take place instead of waiting for a selection.

FastTrak TX2000 (tm) BIOS Version 2.00.0.33
(c) 195-2002 Promise Technology, Inc. All rights reserved.

ID	MODE	SIZE	TRACK-MAPPING	STATUS
1 *	2x2 Mirror/Stripe	xxxxxxxxM	xxx/xxx/xxx	FUNCTIONAL

Press <Ctrl-F> to enter FastBuild (tm) Utility

The details shown under SIZE will describe an array approximately 120-160GB in size.

- Once the above steps are completed, allow Windows 2000 to boot up, log on to it, then format the array using these steps:
 - Right-click on the “My Computer” icon and select “Manage” from the context menu.
 - In Computer Management’s left pane, select Disk Management.
 - Windows should walk through a short “Write Signature” wizard. It should also indicate only one volume to select (which needs to be selected)
 - Right-click on the GRAY SQUARE representing the drive (array). Select “Revert to Basic.” The gray square should change from “Dynamic” to “Basic.”
 - Right-click on the Unallocated Space next to the gray square, and select “Create Partition.” Entire disk, NTFS format, ALLOCATION UNIT SIZE 64K.

If the array is having problems, the following symptoms may appear as described in the top section. To verify the array is having problems, reboot the machine and watch for the Promise controller's banner to appear as one of the two shown below:

FastTrak TX2000 (tm) BIOS Version 2.00.0.33
(c) 195-2002 Promise Technology, Inc. All rights reserved.

The information shown in the previous shot will describe which drives are still online, not which drives are failed. In this condition, one or maybe two drives may be marked as “failed or disconnected.” Simple deductive logic will reveal which drives are the problem. For example, in the previous shot, both drives on channel 1 and the Master unit on channel 2 are still marked as present and working. Therefore, the channel 2 Slave unit is the failed device.

Corrective action for an array in this condition is as follows:

1. Exit the Promise FastBuild utility and shut down the unit.
2. Having identified which drive(s) have failed, open the system unit and take care to correctly identify the failed drive(s) and replace.
3. The Promise controller's BIOS banner should remain as shown above; however, this time Press CTRL-F and in the Main Menu select option <5> to Rebuild the array. The following screen will appear:

FastBuild (tm) Utility 1.32 (c) 1996-2001 Promise Technology, Inc.				
[Rebuild Array Menu]				
Array No	RAID Mode	Total Drv	Capacity (MB)	Status
Array 1	Mirror	4	#####	Critical
Array 2	----	----	-----	----
Array 3	----	----	-----	----
Array 4	----	----	-----	----
[Keys Available]				
[▲] Up [▼] Down [ESC] Exit [Enter] Select				

Press Enter to select the array. The next screen looks like this:

FastBuild (tm) Utility 1.32 (c) 1996-2001 Promise Technology, Inc.			
[Rebuild Array - Assign Spare Drive]			
Array No	RAID Mode	Total Drv	Status
Array 1	Mirror	4	Critical
Stripe Block: Not Available			
[Select Drive for Rebuild]			
Channel:ID	Drive Model	Capacity (MB)	
2:Sla	MFR MODELNUM	#####	
[Keys Available]			
[▲] Up [▼] Down [ESC] Exit [Enter] Select			

Press Enter to select the new drive. The next displays are as shown below:

```
FastBuild (tm) Utility 1.32 (c) 1996-2001 Promise Technology, Inc.
```

```
[ Rebuild Array - Assign Spare Drive ]
```

Array No	RAID Mode	Total Drv	Status
Array 1	Mirror	4	Critical

```
Stripe Block: Not Available
```

```
Channel:ID      Please Wait While Duplicating The Image  
#:M/S          [Progress Bar] 40% Completed
```

```
[ Keys Available ]
```

```
[▲] Up    [▼] Down    [ESC] Exit    [Enter] Select
```

This display will take some time to progress. Once complete, the message will appear as shown below:

```
FastBuild (tm) Utility 1.32 (c) 1996-2001 Promise Technology, Inc.
[ Rebuild Array - Assign Spare Drive ]

Array No      RAID Mode      Total Drv      Status

Array 1       Mirror         4              Critical

Stripe Block: Not Available

Channel:ID    Pleas  Array was recovered....
# :M/S       [ ]    <Press Any Key to REBOOT>

[ Keys Available ]

[▲] Up      [▼] Down    [ESC] Exit   [Enter] Select
```

After pressing a key, the system will reboot, the Promise BIOS banner will return to normal, and the system is ready to return to normal operation.

For an array that is “Off Line” (failed with all data lost):

FastTrak TX2000 (tm) BIOS Version 2.00.0.33
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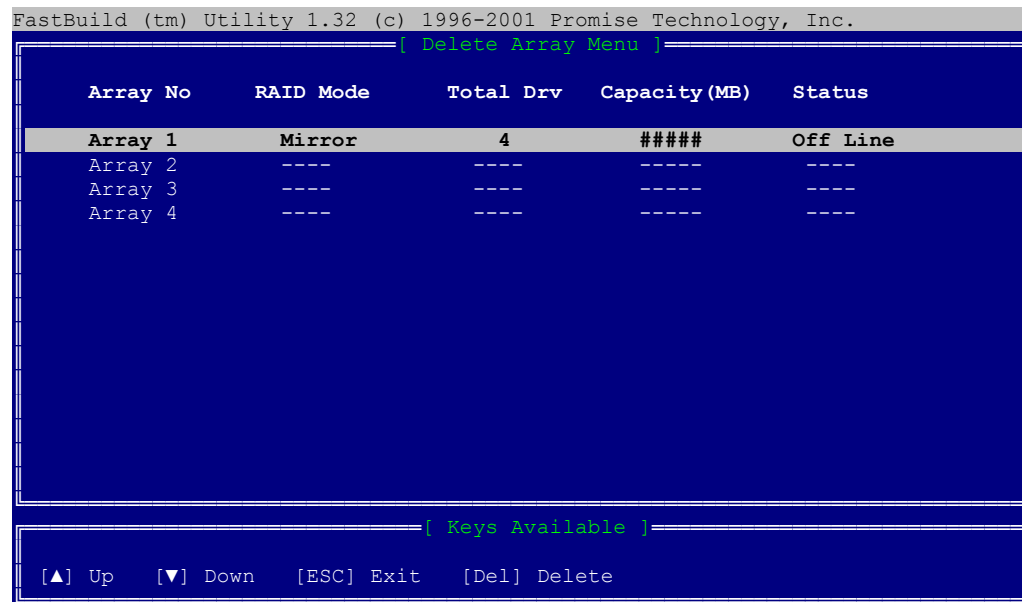
ID	MODE	SIZE	TRACK-MAPPING	STATUS
1 *	2x2 Mirror/Stripe	xxxxxxxM	xxx/xxx/xxx	Off Line

Problem is detected with Array : 1

Press <Ctrl-F> to enter FastBuild (tm) Utility or
Press <ESC> to continue booting...

All data is already lost in this case. Follow the same steps as with critical arrays to identify the failed drives. In this case, two or more drives will be shown as “failed or disconnected.” Use the same steps to physically identify and replace the failed drives as with Critical arrays, then delete the remainder of the array as follows:

1. Upon powering up the unit, the array will still show status as “Off Line” as shown above. Use CTRL-F to enter the Main Menu.
2. Select option <4> to delete the remainder of the failed array. The following menu will appear:



Press the Del key to delete the array.

The following message will appear:

```
FastBuild (tm) Utility 1.32 (c) 1996-2001 Promise Technology, Inc.
[ View Array Definition Menu ]
```

Array No	RAID Mode	Total Drv	Capacity (MB)	Status
Array 1	Mirror	4	#####	Critical

Stripe Block: Not Available

```
[ Drives Assignments ]
```

Channel:ID	Drive Model	Capacity (MB)
1:Mas	MFR MODELNUM	#####
2:Mas	MFR MODELNUM	#####
?:?	Failed or disconnected...	
?:?	Failed or disconnected...	

Are you sure you want to delete this array?
Press Ctrl-Y to delete, or others to Abort..

Press Ctrl-Y to confirm, and another dialog will appear:

```
FastBuild (tm) Utility 1.32 (c) 1996-2001 Promise Technology, Inc.
[ View Array Definition Menu ]
```

Array No	RAID Mode	Total Drv	Capacity (MB)	Status
Array 1	Mirror	4	#####	Critical

Stripe Block: Not Available

Would you like to clean the MBR and reserved sector?
1: Doing so will result in total loss of all data.
2: < Press Y to continue or N to return to menu >
?:
?:? Failed or disconnected...

```
[ Keys Available ]
```

[▲] Up [▼] Down [ESC] Exit [Del] Delete

Press Y to erase all data on the drives.

The final message will appear:

```
FastBuild (tm) Utility 1.32 (c) 1996-2001 Promise Technology, Inc.
[ View Array Definition Menu ]

  Array No   RAID Mode   Total Drv   Capacity (MB)   Status
  -----
  Array 1     Mirror         4          #####      Critical

Stripe Block: Not Available

Would you
1: Doing so w  Array was deleted.... sector?
2: < Press Y  <Press Any Key to REBOOT> a.
?: >
?:? Failed or disconnected...

[ Keys Available ]

[▲] Up  [▼] Down  [ESC] Exit  [Del] Delete
```

Press any key to reboot the system. The Promise BIOS banner will appear as shown in the section “Initial Configuration of Array.” Follow that procedure to restore functionality.